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Research Article

Viral threats: the role of TikTok in facilitating trade in CITES-listed species in Lomé, Togo

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Abstract

Wild meat trade poses significant threats to biodiversity and human health. Despite these threats, trade and consumption are increasing, driven largely by growing demand in urban centers. Easy access to the internet and social media platforms further facilitates wildlife trade and consumption by connecting traders and consumers. This study examines 80 TikTok videos from public (open) accounts of two wild meat traders in Lomé, Togo, showcasing wild meat sales between November 2022 and April 2024. The videos featured various smoked wild animals, representing approximately 3,526 individuals across 27 inferred species, predominantly birds (40.9%) and mammals (39.6%), but also included reptiles (19.5%). Prices for whole smoked animals varied significantly (from a minimum of 3.4 USD to a maximum of 340 USD), depending on the species and the size of the individual animal. Among the 27 recorded species were the Endangered white-bellied pangolin (*Phataginus tricuspis*), classified as a CITES Appendix I species with a declining population trend; the Vulnerable Buffon's kob (*Kobus kob* ssp. *kob*); the Near Threatened Defassa waterbuck (*Kobus ellipsiprymnus* ssp. *defassa*); and three CITES II-listed species. The 80 videos had each been viewed between 660 and 216,000 times, and all 80 videos had been viewed 1,795,079 times in total. This high level of visibility may fuel demand and unintentionally promote further trade by exposing a broad audience to such content. The findings highlight how social media can have significant negative conservation implications for the long-term survival and sustainable management of these species. Although enforcement mechanisms have been implemented to curb illegal wildlife trade on social media, these platforms still serve as vast, often unregulated marketplaces where traders and customers can easily connect, offering a level of convenience that traditional markets lack. We recommend that social media platforms strengthen their enforcement measures while conservationists leverage these platforms to raise awareness, promote wildlife protection laws, and mobilize public support for conservation efforts. The demand for wild meat in Lomé is driven by the growing population, cultural and economic benefits, as well as a lack of awareness. The study highlights the urgent need for targeted education, stronger enforcement of wildlife protection laws, and better communication about the legal status and conservation importance of the species.

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Key words: Animal welfare, bushmeat trade, CITES-listed species, drivers for demand, sustainable resource use

Introduction

Overexploitation and habitat loss are the major threats driving many species toward decline and local extinction (Maxwell et al. 2016; IPBES 2019). Unsustainable hunting practices and unregulated wildlife trade further exacerbate this issue, posing a significant threat to global wildlife conservation (Craigie et al. 2010; Phelps et al. 2010; Coad et al. 2019; Cardoso et al. 2021; Roy and Kumar 2024). Currently, one in every five wild animal species is exploited for trade, with tropical species being particularly vulnerable (Scheffers et al. 2019). Live wild animals, body parts, and derivatives are traded for various purposes, including decoration, medicinal use, food, and as pets (D'Cruze et al. 2020, 2021, 2024; El Bizri et al. 2020; Harrington et al. 2021; Ingram et al. 2021).

Specifically, wild meat hunting for trade and consumption poses a pervasive threat to conservation efforts across Africa (Furnell et al. 2015; Ripple et al. 2016; Ordaz-Nemeth et al. 2017; Mugerwa et al. 2020). This issue is particularly severe in the West African region, where mammals are predicted to experience ~70% decline due to overhunting (Benítez-López et al. 2019). Pressure on species is exacerbated by the growing degradation of tropical forests caused by logging, urbanization, agriculture, and infrastructure development (Wilkie et al. 2000; Venter et al. 2016; Benítez-López et al. 2019). Additionally, rapid population growth has increased the demand for wildlife resources (Fa et al. 2002; Ripple et al. 2016), further straining these already vulnerable species.

Wild meat hunting for trade and consumption has led to notable declines in various wildlife populations, including some species that are already endangered (Fa et al. 2002; Bowen-Jones et al. 2003; Lindsey et al. 2013; Gonçalves et al. 2019; Ingram et al. 2021), especially in areas with inadequate anti-poaching measures and law enforcement. This unsustainable exploitation drives local and regional defaunation, pushing some species toward extinction and undermining biodiversity (Bowen-Jones et al. 2003; Lindsey et al. 2013; Ziegler et al. 2016; Gonçalves et al. 2019). The resulting reduction in animal populations disrupts forest ecosystem balance, as many hunted species, particularly birds and primates, play crucial ecological roles in seed dispersal, herbivory, and predation (Marcot and Vander Heyden 2001; Hughes et al. 2023b), and their removal may lead to unintended ecological consequences (Nasi et al. 2008; Abernethy et al. 2013; Hughes et al. 2023b) and wider impacts on the carbon storage capacity of forests (Gardner et al. 2019).

In West and Central African regions, where access to domesticated meat and fish is often limited, wild meat has long served as an important source of protein (Wilkie et al. 2016; Ordaz-Nemeth et al. 2017; Djagoun et al. 2022; Sonhaye-Ouyé et al. 2022; Simo et al. 2024). Its significance extends to urban areas, where alternatives are available, reflecting that consumption is driven not only by necessity but also by cultural preferences and taste (Morsello et al. 2015; Nguyen et al. 2021; Simo et al. 2023, 2024). Wild meat also often plays a role in supplementing household incomes (Brashares et al. 2011; Ordaz-Nemeth et al. 2017; Ingram et al. 2021; Sonhaye-Ouyé et al. 2022). Trade from rural to urban areas contributes significantly, at least at the local level, to the economies of West and Central African

regions (Green et al. 2024), supporting many stakeholders along the value chain (Sonhaye-Ouyé et al. 2022; Simo et al. 2023). For example, many women involved in the wild meat trade in the Republic of Congo depend on these sales as a source of income to support their households (Green et al. 2024). This underscores the need to ensure the sustainable use and conservation of wildlife resources, as recommended by the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity of the Convention on Biological Diversity (CBD) (www.cbd.int/sustainable/addis.shtml) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) through its Resolutions. In particular, CITES Resolution Conf. 13.11 (Rev. CoP18) expresses concerns that the illegal or unsustainable trade in wild meat threatens not only CITES-listed species but also the food security and livelihoods of wildlife-dependent communities.

Trade in wildlife typically includes sales in markets, restaurants and clandestine transactions (Lescuyer and Nasi 2016; Randolph et al. 2022; Simo et al. 2023). However, as internet access has become increasingly widespread, traditional physical trading of wildlife has also shifted towards online markets (Shirey and Lamberti 2011; Lavorgna 2014; Bergin et al. 2018; Siriwat and Nijman 2018; Nijman et al. 2021, 2023). The rise of e-commerce and improved internet accessibility have provided traders and suppliers with unprecedented connectivity to new consumers and expanded markets, particularly through social media platforms (Nijman et al. 2021, 2023; Morcatty et al. 2021).

Social media can also influence consumer attitudes and fuel the demand for wild animals (Nijman et al. 2023). It provides visual content (high-quality images and videos) that can drive interest and sales, making it easier for traders to attract consumers (Kujur and Singh 2020). In addition, the convenience and anonymity provided by social media platforms have made it easier for traders to reach a global audience, facilitating illegal wildlife trade (Harrison et al. 2016; Bergin et al. 2018). Recent reports highlight a thriving illegal trade of wildlife online, and raise significant conservation concerns for numerous species (IFAW 2014; Hinsley et al. 2016; Bergin et al. 2018; Morgan and Chng 2018; TRAFFIC 2024). This is despite many social media platforms having put in place mechanisms aimed at reducing illegal trade in endangered animals and plants (Coalition to End Wildlife Trafficking Online 2021; TRAFFIC 2021).

Launched in 2017, TikTok has quickly become a major player in mainstream social media. By early 2023, it had over one billion monthly active users (as of 2024, www.statista.com). Known for its focus on short-form video sharing, TikTok has a particularly strong appeal among younger audiences. As of January 2023, one-quarter of marketers reportedly used TikTok for advertising (as of 2023, www.statista.com). Like other platforms, such as Facebook, Instagram and YouTube (Siriwat and Nijman 2018; Harrington et al. 2019; Morcatty et al. 2021; Nijman et al. 2021, 2023), TikTok has become a notable avenue for advertising wild animals (Hernandez 2022; Fiennes et al. 2023).

With easy access to the internet and social media platforms, wild animals and their products are openly observed online for sale in Lomé, the capital city of Togo. However, the extent, dynamics, and factors influencing wild meat trade and consumption in the city are poorly understood. To gain insights into these aspects, we identified wild meat traders through an online search and analyzed TikTok posts featuring videos advertising wild meat for sale in Lomé. Our aim was to assess the diversity of species sold online for wild meat, their commercial value, and potential

conservation impacts, with a focus on species listed in the CITES Appendices, by addressing the following research questions: (1) Which species are traded online for wild meat consumption in Lomé, Togo? (2) What is the extent of the online trade in meat from species listed in the CITES Appendices? (3) What are the dynamics of this trade, including its pricing mechanism? (4) What is the level of user engagement in this online wild meat trade, measured by metrics such as likes, comments, and shares? (5) What are the potential conservation impacts of this trade?

Overall, our goal is to better understand the demand for wild meat trade in Togo and provide insights that can support Togo's CITES management authority in creating targeted awareness campaigns. These efforts aim to combat illegal wildlife trade, protect endangered species, and promote the sustainable use of wildlife resources. This aligns with the implementation of CITES Resolution Conf. 13.11 (Rev. CoP18), which urges Parties to collaborate internationally to address the challenges of wild meat trade and consumption through information sharing and joint initiatives.

Methodology

Study area

The Togolese Republic, located in West Africa, is bordered by Burkina Faso in the north, Ghana in the west, Benin in the east and the Atlantic Ocean in the south. Spanning an area of 56,600 km^2 (Dansi et al. 2013), its human population increased more than fivefold between 1960 and 2022, with an average annual growth rate of 2.3% (INSEED 2022). The country is divided into five administrative regions from north to south: the Savanna region, Kara region, Central region, Plateaux region, and Maritime region. These regions are inhabited by 21 principal ethnic groups (Dansi et al. 2013).

Togo has two distinct climatic regions, the southern to the central regions are characterized by a subequatorial climate with two rainy seasons and two dry seasons, and the northern region with a Sudanian climate type, characterized by only two seasons - rainy and dry (Afidegnon 1999). As a consequence of its location, the Togolese landscape transitions from coastal grasslands in the south to equatorial and moist tropical forests, ending in Sudan savannas in the north (Segniagbeto et al. 2011). Within these varied ecosystems, a rich diversity of animal species thrives, as indicated by the presence of approximately 178 mammal species (Amori et al. 2016; Assou et al. 2021), 43 lizard species (Segniagbeto et al. 2015), and 91 snake species (Segniagbeto et al. 2011).

As of January 1, 2023, the minimum wage in Togo is set at 52,500 CFA Francs (89.25 USD) per month. This represents an increase from the previous minimum wage of 35,000 CFA Francs (59.5 USD), which had remained unchanged for a decade. The raise aims to enhance the purchasing power and overall working conditions of employees, addressing the challenges posed by rising living costs and inflation (https://www.minimum-wage.org/international/togo, accessed on June 25, 2024). Agriculture is one of the main sectors of the country's national economy, producing food crops such as maize, cassava, millet, sorghum, and yam, as well as cash crops like coffee, cocoa, and cotton (Correa 2004; Sanoussi and Wonyra 2019). In rural areas, local communities primarily subsist on agriculture, livestock farming and hunting (see Sonhaye-Ouyé et al. 2022).

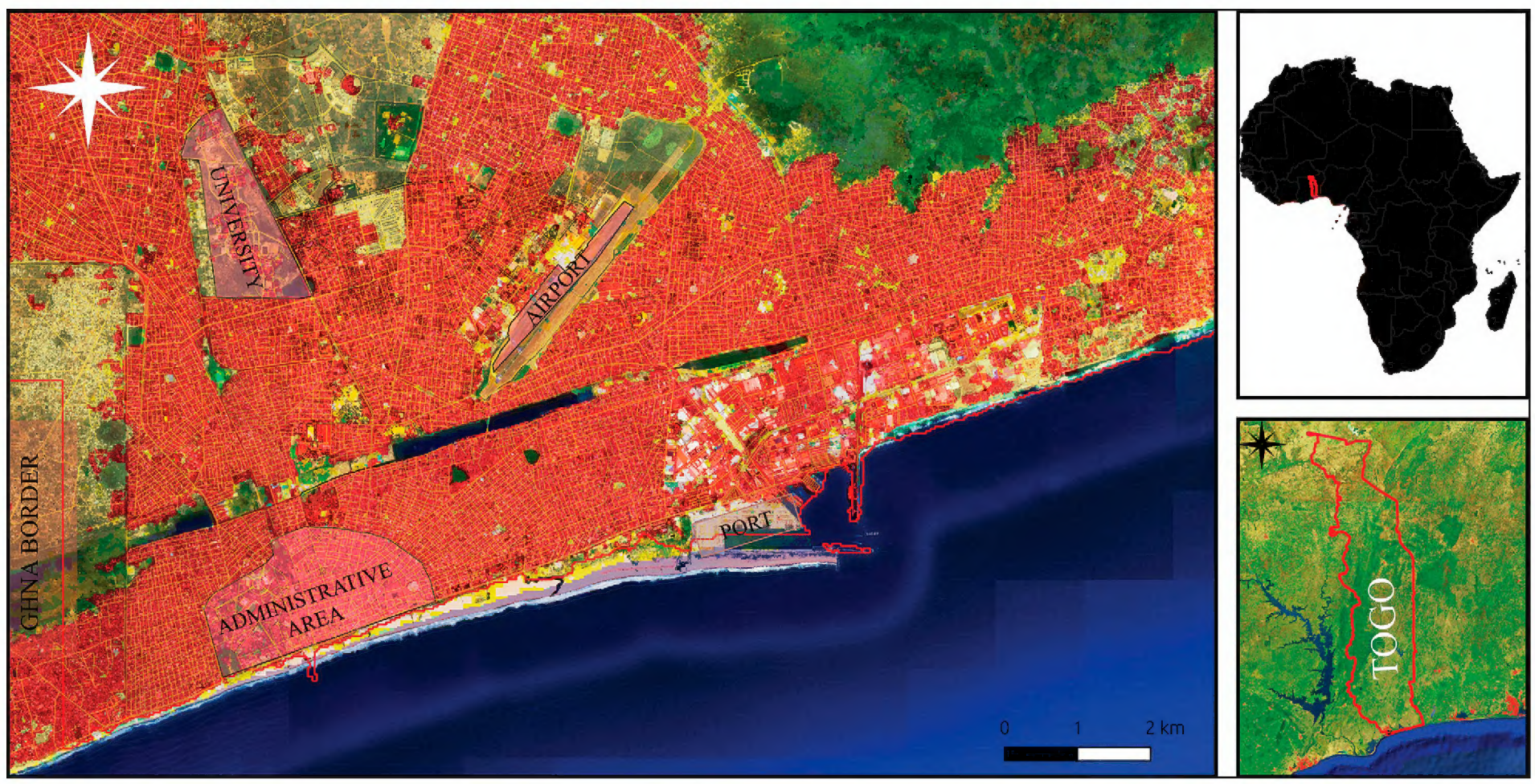

Figure 1. Map of Lomé, the capital city of Togo.

Lomé, the capital and largest city in Togo (Fig. 1), had an estimated population size of 2.188 million people in 2022, accounting for 27% of the country's total population (INSEED 2022). Situated in the Maritime region, it is bordered by the Atlantic Ocean in the south. The city experiences a subequatorial climate, characterized by two distinct dry seasons (December-March and August-September) and two rainy seasons (April-July and October-November). The city offers unique climatic conditions, with an average temperature of 28.5 °C, annual rainfall of 850.17 ± 242.65 mm and relative humidity exceeding 75% due to coastal influence (Togo General Directorate of National Meteorology data 2016-2022).

Video selection

Videos depicting wild meat being offered for sale online in Lomé were collated using the search function in TikTok (www.TikTok.com) in April and May 2024. The following French (Togo official language) search terms were used: "viande de brousse" (wild meat), "viande de brousse Lomé" (wild meat Lomé), "viande de brousse Togo" (wild meat Togo), "Lomé", "TikTokTogo". All videos posted were manually screened for relevance, without the use of automated web scrapers. Only posts openly advertising carcasses of whole wild animals for sale as wild meat were included in the dataset. Some relevant videos were posted twice on different dates; however, such videos were only considered for the first time they were posted. All videos that conformed with our inclusion criteria were downloaded and saved for further analysis.

Data extraction and analysis

Data were manually extracted from all videos in April and May 2024. For each video, we extracted the date the video was posted, the number of views, 'likes', and comments. The 'likes' per view ratio was calculated as the

number of 'likes' divided by the total number of views per video, providing a measure of relative user engagement. We also viewed each video and recorded the taxonomic class and order of any animals shown and the estimated number of individuals (when possible). Additional details were recorded, including species names advertised for sale and viewer comments indicating potential purchase interest. In all cases, the seller displayed the animal carcasses and provided either the common or local name of each species. Species identification was further verified through the authors' extensive experience assessing wildlife and wild meat trade in Togo, developed over more than a decade of field work.

All comments were analyzed manually. Although the number of posts containing comments beyond simple price or delivery inquiries was too limited (n = 517) to allow for a comprehensive sentiment analysis or detailed statistical assessment of viewer responses, these comments (excluding price and delivery inquiries) were categorized as negative (against), neutral, or positive (in favor) to wild meat trade. A Kruskal-Wallis nonparametric test was used to test for statistical differences between the categories.

We identified the animals shown in each video to the lowest taxonomic level, and where possible, to species level based on the common or local name provided and visible distinguishing features such as morphology (mainly) and color, contingent on video quality. For each unique species identified, we gathered information on their international conservation status and population trend, using the IUCN Red List of Threatened Species categories, and species information (https://www.iucnredlist.org/). We also checked whether the species was listed in the CITES appendices (https://speciesplus.net/).

Prices of wild meat provided by the traders were for whole smoked animals. Monetary values were reported in West African CFA Francs (XOF) and converted to US dollars (USD) using 1 CFA Francs = 0.0017 USD (conversion rate as of 23.05.24, xe.com). A Kruskal-Wallis test was used to test for statistical differences between the prices per whole smoked animal across species. All analyses were performed in R Statistical Programme (R Core Team 2022).

In line with ethical research practices (see Zook et al. 2017), to protect the identity of the traders, the names or URLs of the TikTok channels were not recorded. Additionally, no identifiable information, such as telephone contact or the geographic location and video setting location, is presented.

Results

Video content

A total of 80 videos posted on two separate open-access TikTok channels located in Lomé, Togo, were analyzed. The videos had been posted on TikTok between November 2022 and April 2024. All of the videos featured a single female (estimated to be aged between 25–34 and 35–44 years old on the two different channels, respectively) advertising the sale of a range of smoked wild animals at a home setting. Specifically, the traders were advertising for costumers to place orders or to collect their orders of wild meat products. In 67 of the videos (83.75%), the trader also promotes her restaurant where she cooks wild meat "on Saturdays and Sundays".

Wild animals featured in the videos

The number of individual smoked wild animals featured in the videos ranged from seven to 91 (median = 42) per video. An estimated total of 3,526 individual animals were featured across all 80 videos, 40.9% (n = 1,443) of which were birds, 39.6% (n = 1,395) were mammals, and 19.5% (n = 688) were reptiles (monitor lizards) (Fig. 2).

We estimate that the wild animals featured across the 80 videos potentially refer to at least 27 different extant species within the sourcing areas in Togo (Table 1), comprising 21 species of mammals (including rodents, ungulates,

Figure 2. Screenshots from videos posted on the TikTok accounts of two wild meat traders in Lomé, Togo.

Table 1. List of 27 inferred species featured across the 80 TikTok videos, their IUCN Red List status, population trend, and CITES status. EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NL = Not listed.

Common name	Scientific name	IUCN status	Population trend	CITES status	Number of videos
White-bellied pangolin	*Phataginus tricuspis*	EN	Decreasing	I	44 (55.0%)
Buffon's kob	*Kobus kob* ssp. *kob*	VU	Decreasing	NL	48 (60.0%)
Defassa waterbuck	*Kobus ellipsiprymnus* ssp. *defassa*	NT	Decreasing	NL	48 (60.0%),
Walter's duiker	*Philantomba walteri*	DD	Unknown	NL	13 (16.3%)
Savanna monitor	*Varanus exanthematicus*	LC	Unknown	II	71 (88.8%)
Nile monitor	*Varanus niloticus*	LC	Unknown	II	71 (88.8%)
African Savanna hare	*Lepus victoriae*	LC	Stable	NL	38 (47.5%)
African wildcat	*Felis lybica*	LC	Unknown	II	21 (26.3%)
Bushbuck	*Tragelaphus scriptus*	LC	Stable	NL	48 (60.0%)
Common quail	*Coturnix coturnix*	LC	Decreasing	NL	01 (1.3%)
Common warthog	*Phacochoerus africanus*	LC	Decreasing	NL	26 (32.5%)
Red River hog	*Potamochoerus porcus*	LC	Decreasing	NL	26 (32.5%)
Crested porcupine	*Hystrix cristata*	LC	Unknown	NL	01 (1.3%)
Double-spurred francolin	*Pternistis bicalcaratus*	LC	Decreasing	NL	60 (75.0%)
Egyptian mongoose	*Herpestes ichneumon*	LC	Stable	NL	34 (42.5%)
White-tailed mongoose	*Ichneumia albicauda*	LC	Stable	NL	34 (42.5%)
Marsh mongoose	*Atilax paludinosus*	LC	Decreasing	NL	34 (42.5%)
Gambian mongoose	*Mungos gambianus*	LC	Stable	NL	34 (42.5%)
Common cusimanse	*Crossarchus obscurus*	LC	Unknown	NL	34 (42.5%)
Gambian rat	*Cricetomys gambianus*	LC	Stable	NL	17 (21.3%)
Greater cane rat	*Thryonomys swinderianus*	LC	Unknown	NL	41 (51.3%)
Helmeted guineafowl	*Numida meleagris*	LC	Stable	NL	65 (81.3%)
Red-flanked duiker	*Cephalophus rufilatus*	LC	Decreasing	NL	13 (16.3%)
Common duiker	*Sylvicapra grimmia*	LC	Decreasing	NL	13 (16.3%)
Side-striped jackal	*Canis adustus*	LC	Stable	NL	03 (3.8%)
Striped ground squirrel	*Xerus erythropus*	LC	Stable	NL	60 (81.3%)
White-faced whistling-duck	*Dendrocygna viduata*	LC	Increasing	NL	29 (36.3%)

small carnivores, hares, and pangolins), four species of birds (including ducks, francolin and guineafowl), and two reptile species (Savanna monitor, *Varanus exanthematicus* and Nile monitor, *Varanus niloticus*). The most frequently featured species were monitor lizards (featured in 88.8% of videos, n = 71), striped ground squirrel (*Xerus erythropus*, 81.3%, n = 65), helmeted guineafowl (*Numida meleagris*, 81.3%, n = 65), double-spurred francolin (*Pternistis bicalcaratus*, 75%, n = 60), 'antelopes' [inferred species include Buffon's kob (*Kobus kob* ssp. *kob)*, bushbuck (*Tragelaphus scriptus*) and Defassa waterbuck (*Kobus ellipsiprymnus* ssp. *defassa*); 60%, n = 48], white-bellied pangolin (*Phataginus tricuspis*, 55%, n = 44), and the greater cane rat (*Thryonomys swinderianus*, 51.3%, n = 41) (Fig. 3, Table 1).

With regard to their international conservation status, one of the inferred species (white-bellied pangolin) is classified on the IUCN Red List as Endangered, one is Vulnerable (Buffon's kob), one is Near Threatened (Defassa waterbuck), 23 (85.2%) are classified as Least Concern, and one is Data Deficient (Walter's duiker, *Philantomba walteri*) (Fig. 3, Table 1). With regard to their population trends, 10 inferred species (37.0%) have wild populations considered to be decreasing, nine (33.3%) have wild populations that are stable, one species has an increas-

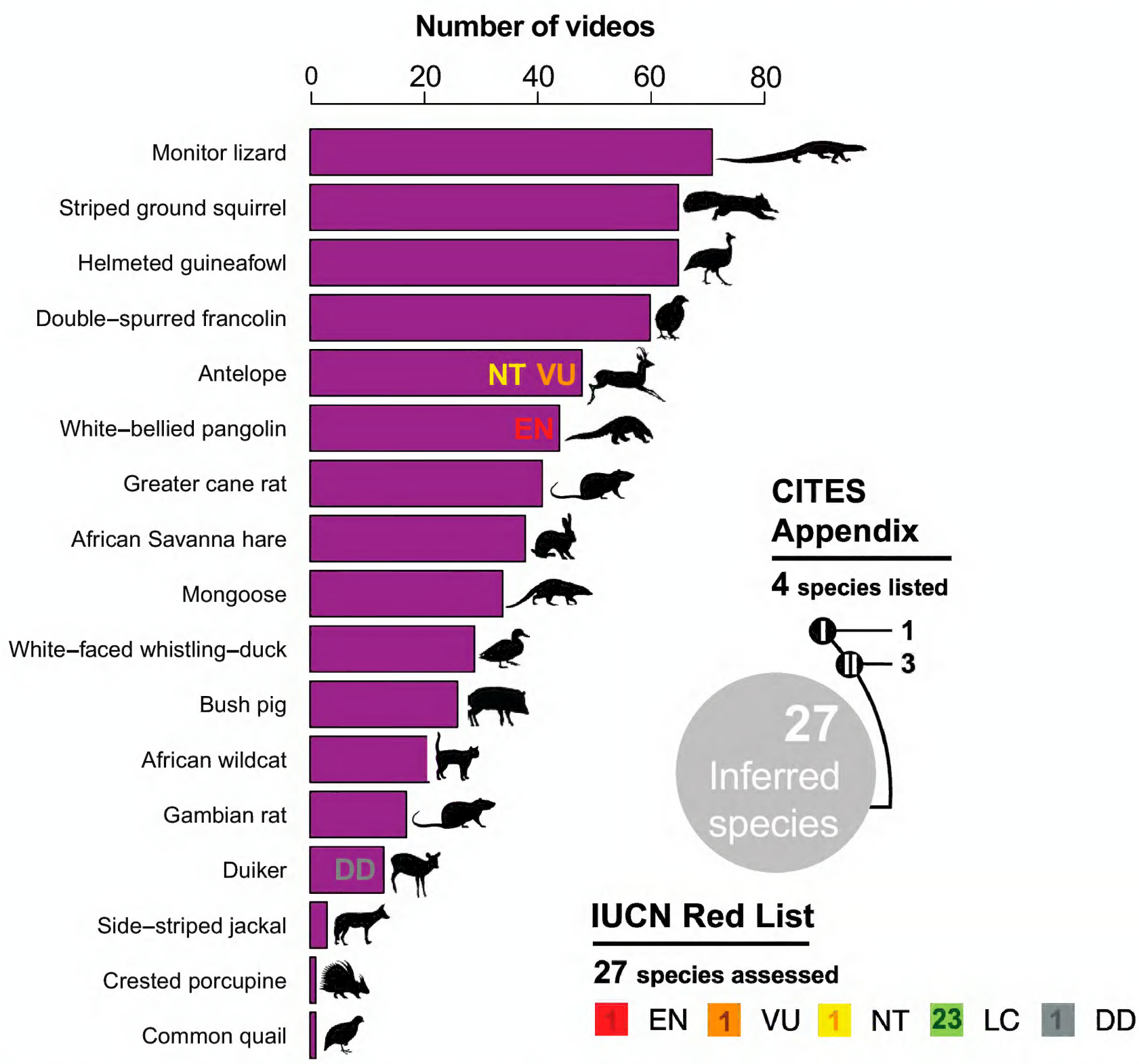

Figure 3. Species or group of species observed for sale as wild meat across 80 TikTok videos and the number of videos each species/group of species was featured in, and summary of the CITES status and IUCN Red List status of the 27 inferred species featured. EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient.

ing population trend, and seven (25.9%) have an unknown population trend. With regards to their status under CITES, one species (white-bellied pangolin) is listed on CITES Appendix I, three species (Savanna monitor, Nile monitor and African wildcat, *Felis lybica*) are listed on CITES Appendix II, and the rest of the species (n = 23, 85.2%) are not listed in CITES Appendices (Fig. 3, Table 1).

Wild meat prices

The reported sale price per whole smoked animal by traders averaged 19,502.60 CFA (32.30 USD; SD = 37,809.60) but varied between 2,000 CFA (3.30 USD) for a whole white-faced whistling duck, double-spurred francolin, and striped ground squirrel and 200,000 CFA (330.47 USD) for a whole 'bush pig' (inferred species include Common warthog, *Phacochoerus africanus* and Red River hog, *Potamochoerus porcus*). Prices varied depending on the species and the size of the individual animal (Fig. 4, Table 2) and there was a significant difference in the price per whole smoked specimen between species (Kruskal-Wallis chi-squared = 91.196, *df* = 16, *p*-value < 0.0001).

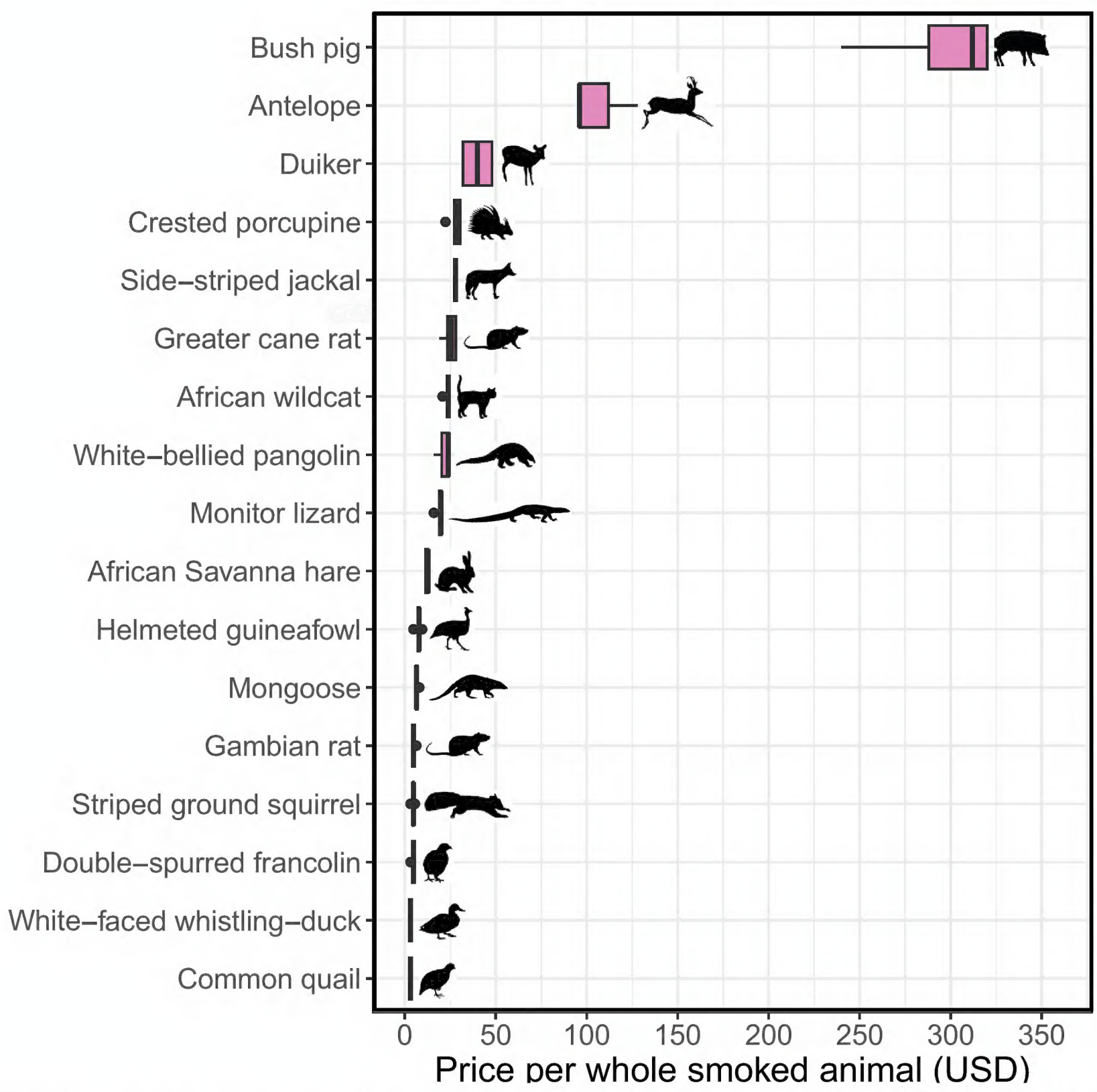

Figure 4. Boxplot showing the price (USD) per whole smoked animal for the species/group of species observed in the 80 TikTok videos.

Table 2. Prices per whole smoked animal (USD) featured in the 80 TikTok videos. Where range values were provided, the mid-point of the range was used. Standard deviation is provided in brackets.

Species	Absolute min. price	Overall average price	Absolute max. price	Number of observations
African Savanna hare	10.20	13.00 (0.80)	13.60	7
African wildcat	22.10	24.90 (1.40)	25.50	6
Common quail	3.40	3.40 (0.00)	3.40	3
Bush pig	255.00	314.50 (40.50)	340.00	4
Crested porcupine	23.80	29.60 (3.50)	34.00	5
Double-spurred francolin	3.40	4.70 (0.70)	5.10	9
Duiker	34.00	42.50 (8.50)	51.00	5
Gambian rat	5.10	5.50 (0.70)	6.80	9
Greater cane rat	20.40	26.70 (3.50)	35.70	10
Helmeted guineafowl	5.10	8.00 (1.90)	10.20	5
Antelope	102.00	112.20 (15.20)	136.00	5
Mongoose	6.80	7.20 (0.90)	8.50	4
Monitor lizard	17.00	20.40 (2.30)	25.50	4
Side-striped jackal	25.50	29.80 (6.00)	34.00	2
Striped ground squirrel	3.40	4.90 (0.80)	5.950	7
White-bellied pangolin	17.00	23.20 (3.30)	25.50	7
White-faced whistling-duck	3.40	3.40 (0.00)	3.40	5

Video reach and popularity

At the time of the analysis, the two channels posting the videos had 7,728 and 15,950 subscribers, respectively. The 80 individual videos had each been viewed between 660 and 216,000 times (mean ± SD = 22,438 ± 32,813; median = 9,787 views) and 50% of videos (n = 40) had been viewed over 10,000 times. All 80 videos had been viewed 1,795,079 times in total. The number of times the videos had been "liked" ranged from 26 to 8,982 (mean ± SD = 661 ± 1,270.40; median = 220.5 "likes"), with a combined total of 52,900 "likes" across all 80 videos. The 'likes' per view ratio ranged from one to five percent (mean ± SD = 3 ± 0.96%; median = 3%). Additionally, the videos had been "shared" a combined total of 6,162 times (range = 1–834; mean ± SD = 77 ± 142.92; median = 27) and had received a total of 3,490 comments (range = 2–710 comments per video; mean ± SD = 44 ± 96.57; median = 13).

Across all videos, 455 comments featured enquiries about where the meat could be collected from, 373 were price enquiries, 265 were people expressing that they wanted a particular product/animal, 77 were people stating that they wanted to visit the seller's location, and 61 were delivery enquiries. Overall, 264 comments expressed positive sentiment towards the posts and were encouraging the sales (for example, "well done", "good job", "we should use social media to promote our business") and 104 expressed negative sentiment towards the posts (for example, "Stop sharing this on social media"). The comments in 25 videos included requests for specific animals that were not detected in the videos analyzed in this study, and included 'snake', 'viper', 'elephant', 'lion', 'leopard', 'crocodile', 'python', 'frog', 'aardvark', and 'monkey'. Six videos included comments warning against sharing the video content on social media, four included comments referring to the illegality of the trade, four included comments expressing concern for the killing of animals/destruction of wildlife, three included comments that specifically mentioned the protection status of species, and one video included comments (n = 3) about the zoonotic disease

Table 3. Categorized warning comments on TikTok posts.

Comment theme	Example statement	Number of videos
Warning against posting/sharing	"You shouldn't display that on social media"	6
	"Stop sharing this on social media"	
Illegality of the trade	"Hunting is prohibited in Togo"	4
	"You can be prosecuted"	
	"Pangolin hunting is prohibited, stop selling"	
	"Do you know you can get yourself into trouble?"	
	"It is prohibited by the law"	
Wildlife/animal protection	"Stop killing animals"	4
	"There will be nothing left in our forests for our children; You are destroying the wildlife"	
Species protection status	"You need to be careful, especially on social media, because there are some species that are protected by the government, so forestry officials can act"	3
	"The pangolin is endangered"	
	"Avoid posting anything related to pangolins on TikTok because it is a highly protected animal that can easily land someone in jail"	
Zoonotic disease risk	"The Pangolin carries COVID"	1

risks of the trade (Table 3). Furthermore, a comment warning a trader to avoid posting anything related to pangolins on TikTok—because it is a highly protected animal that can easily land someone in jail—received dismissive responses such as, "it would be protected in the stomach," and "the pangolin is not protected in Togo, but in Cameroon, yes."

Discussion

Social media offers a vast, often largely unregulated marketplace where traders and customers can easily connect, providing a level of convenience that traditional markets lack (Bizzi and Labban 2019). This convenience has made social media a significant platform for the wildlife trade (Hernandez-Castro and Roberts 2015; Harrison et al. 2016; Bergin et al. 2018; Nijman et al. 2021, 2023), providing researchers with widespread open-access insights into the species available for sale and those that are proving popular amongst viewers and consumers.

Our study reveals that a wide variety of wild animals are being offered for sale as wild meat via TikTok channels by vendors based in Lomé, Togo. The 80 posts analyzed featured at least 27 inferred species, mostly (78%) mammals, along with birds (15%) and reptiles (7%), estimated to comprise more than 3,500 individual animals, advertised for sale between November 2022 and April 2024. Among the most frequently featured species were monitor lizards, striped ground squirrels, guineafowl, francolins, antelopes, white-bellied pangolins and greater cane rats. However, trade patterns at wild meat markets in West Africa are often dynamic, with species composition, volume and trade price fluctuating on both spatial and temporal scales (Sackey et al. 2023). In particular, viewer comments in this study suggest that other species beyond those detected in the videos are also already in demand, including frogs, snakes, crocodiles, primates, elephants, lions and leopards. Moreover, given that some of these species, such as big cats, are not only known to be traded as meat but for other spiritual and medicinal uses in West Africa and internationally (D'Cruze et al. 2020; Horion et al. 2025; Williams et al. 2025), further investigation is needed to understand the drivers of this particular demand on social media.

Despite these limitations, the species and estimates of the number of animals involved provide the first initial indication of wild meat trade activity occurring through social media in Togo. Our findings also reflect some comparable patterns of wild meat trade found at online marketplaces in other countries in West Africa. Moloney et al. (2023), for example, similarly found that mammals dominated the online wild meat trade on Facebook in Nigeria and Côte d'Ivoire with respect to the diversity of species observed as being traded. Likewise, they found that rodents, pangolins, monitor lizards, and duiker were among the most frequently advertised species. However, they identified several species not directly detected in the videos we analyzed, such as primates, pythons, tortoises, crocodiles, civets, and bats (although primates, pythons, and crocodiles were mentioned in the comments of the posts we analyzed). These differences highlight the value of case studies such as this to garner a more complete understanding of the diversity of species that may potentially be impacted by this trade, and the geographical differences in species availability and consumer preferences in different markets.

Our analysis of the species advertised for sale on TikTok also aligns with those found at well-established bushmeat markets in West and Central Africa (Mbun and Nguemwo 2021; Gonedelé-Bi et al. 2022; Sackey et al. 2023). Previous studies at physical markets, for example, support the popularity of rodents and ungulates in the West African wild meat trade (Gonedelé-Bi et al. 2022; Gossé et al. 2022), the prevalence of which is thought to be due to their higher reproductive rates and ability to adapt to human disturbed landscapes (Mcnamara et al. 2016; Gonedelé-Bi et al. 2022). In Ghana, for example, hunting and sale of rodents, small carnivores, and ungulates is reportedly embedded within the dynamic livelihood strategies of low-income farming communities as a means of boosting income (Alexander et al. 2015). In Togo, wild meat is consumed in both rural and urban areas (Luiselli et al. 2020; Sonhaye-Ouyé et al. 2022) and more people reportedly consume wild meat frequently in Lomé than in other cities in West Africa (Luiselli et al. 2020). Wild meat is sold openly at Hollando market located within Assigamé (Lomé's largest market), and at numerous roadside stalls, especially along National Route N°1 (Lomé-Cinkassé), where vendors cater to travelers and local customers alike (Assou, unpublished data). For example, vendors have been observed on the roadside in rural areas with rodents, pythons and cobra on sale, waiting for consumers to pass by on their way back to Lomé (D'Cruze, personal observation).

It is likely that the wild animals detected in this study were sourced in Togo because all the species identified (n = 27) have extant populations in the country (Table 1). Furthermore, wild meat sold at traditional physical markets reportedly originates from rural areas in Togo such as Zio and Yoto districts in the Maritime region, Kloto in the Plateaux region, and Sokode, Bassar and Tchamba districts in the Central region (Assou, unpublished data). Illegal harvesting of animals, mostly mammals, for wild meat, as well as traditional medicine and the international pet trade, has also been observed within some protected areas and buffer zones (Atsri et al. 2020; Segniagbeto et al. 2020; Assou et al. 2021; Sonhaye-Ouyé et al. 2022). Sonhaye-Ouyé et al. (2022), for example, reported at least 33 species [including almost all of those identified in our study plus some not identified such as crocodiles, primates (Mona monkey, Patas monkey, and olive baboon), genets, and buffalo] being hunted in the Fazao Malfakassa National Park (FMNP) (one of Togo's largest protected areas) to be sold as wild

meat in adjacent villages. It is possible, therefore, that some of this trade has now been incorporated into online marketplaces like TikTok.

Wild meat is increasingly sought after in urban areas due to its perceived exceptional taste and nutritional benefits (Luiselli et al. 2020; Nguyen et al. 2021; Torres et al. 2022). As such, although it serves as an important source of protein for some communities, meat from wild animals is usually regarded as a luxury food in urban centers and can drive higher demand and prices compared to domesticated meat alternatives (van Vliet et al. 2011; Chausson et al. 2019; Nguyen et al. 2021; Green et al. 2024). Population growth in rural and urban areas across Africa, along with economic incentives such as high wild meat prices, low agricultural income, and increased access to wild animals due to industrial expansion, has driven increased hunting efforts and shifts to more efficient but destructive hunting methods (Bowen-Jones et al. 2003; Damania et al. 2005; Lindsey et al. 2013). Although species have been openly advertised on social media in Togo for the international pet market (Harrington et al. 2021), as far as we are aware, this is the first time that wild meat has been documented on online marketplaces in Togo and on TikTok more generally. In particular, this is a new development for threatened species in the trade, such as pangolins.

Conservation and human health risks

Our study raises questions about the sustainability of this type of commercial trade activity in West Africa (Djagoun et al. 2018). While communities have traditionally used wildlife for centuries, globalization, human population growth, along with substantial digital and communication advances, have meant that traditional use and trade that may have once been sustainable, may not necessarily be so now or in the future (Hughes et al. 2023a). The apparent shift or increasing trend from subsistence and small-scale wildlife trade to large-scale commercial harvesting and trade that is likely targeting urban consumers, and /or broader rural communities as they gain access to social media platforms, is particularly concerning from a conservation perspective (Macdonald et al. 2021; Hughes et al. 2023a). According to the IUCN Red List of Threatened Species, 11% of the species featured in the posts analyzed are already considered to be threatened or Near Threatened (including the white-bellied pangolin, Buffon's kob, and Defassa waterbuck), and many have declining (37%; 10 inferred species) or unknown (26%; 7 inferred species) wild population trends. Some of the most frequently featured species are also considered highly threatened by trade. The white-bellied pangolin, for example, which featured in 55% of the posts with 137 individuals detected, is endangered globally, predominantly due to demand for their meat and body parts for use in traditional medicine and food across Africa (Soewu and Sodeinde 2015) and Asia (e.g. Mahmood et al. 2012). Pangolins are found on sale at wildlife markets throughout West and Central Africa and pressure from hunting is reportedly increasing (Ingram et al. 2018). While there are concerns that illegal actors are increasingly sourcing wildlife from African countries for traditional medicine markets elsewhere, including China (Ingram et al. 2018), recent evidence indicates that local consumption of pangolin meat remains the main driver of hunting in West Africa, rather than international trade (Emogor et al. 2023, 2025). Clearly, any trade in pangolins via social media represents a serious conservation concern, given

the vast potential reach of these platforms. For example, TikTok has more than 1.5 billion monthly active users (as of 2024, www.statista.com), and social media in general remains the most popular dedicated video-sharing application, with more than 3.6 billion users globally and over 0.83 million users in Togo alone as of 2023 (www.statista.com). This vast reach significantly amplifies the scale and visibility of wildlife trade content, which could rapidly fuel demand and accelerate species decline if not adequately addressed.

Moreover, the posts analyzed in this study appeared to be popular having been viewed nearly 1.8 million times in total with nearly 53,000 'likes' (> 22,400 views and ~660 'likes' per video on average). The likes per view ratio was 3% (± 0.96%), indicating consumer moderately support and demand for this online trade. The two TikTok channels had ~7,700 and 15,950 subscribers, respectively, further demonstrating the contents' potential reach. The most popular video, which had been viewed > 216,000 times, with almost 9,000 'likes' and 834 shares, openly featured smoked pangolin for sale, with the trader encouraging viewers to "choose wild meat over domestic alternatives because it is much tasty and healthier". Although the reach of a post does not necessarily equate to influence (Silk et al. 2021), highly viewed or liked videos such as this may drive demand for wild meat or influence human behaviors (e.g. Harrington et al. 2019; Liu et al. 2020; Moorhouse et al. in press).

In our study, although some viewers appeared to be aware of the legal and conservation implications of certain species being offered for sale (e.g. pangolin), we observed that supportive comments (n = 264) were more frequent than neutral (n = 149) and negative (n = 104), suggesting that the popularity of the posts may represent a level of 'acceptability' of the trade and could influence social norms (Riddle and Mackay 2020; Thomas-Walters et al. 2020; Moloney et al. 2023) or behavioral intentions (e.g. Young and Jordan 2013; Moorhouse et al. in press). By liking, sharing and otherwise engaging in these posts, viewers are not only passive consumers but are also active promoters contributing to the proliferation of wildlife trade on the platform (Harrington et al. 2019). In this context, it is concerning that the two most viewed videos (with 123,000 and 216,000 views, respectively) and three of the four most popular videos (those with the highest like:view ratios) featured the endangered white-bellied pangolin.

In addition, monitor lizards (Savanna and Nile monitors) appeared in 89% of the videos analyzed with ~688 individuals recorded, and the African wildcat was observed in over a quarter of the videos. Whilst these species are categorized as Least Concern on the IUCN Red List, they have unknown wild population trends meaning that there is currently no available information on the conservation status and distribution of these species in Togo. This raises significant concerns about the sustainability of the off take. The presence of these species in online trade, and the potential conservation implications, therefore, warrants further investigation. Moreover, juveniles of these species are extensively exported from Togo each year for the international pet trade (see CITES trade database: https://trade.cites.org/en/cites_trade - accessed 30.05.24). This practice may intensify pressure on monitor lizard populations in the country, posing a threat to their long-term conservation.

Other studies show that hunters in West Africa have reported declines in the availability of other species such as bushbuck, duiker, pangolin, porcupine, river hogs, and primates captured for bushmeat over the past decade (Alexander

et al. 2015). In particular, the numbers of primates being killed throughout the region for wild meat is thought to be unsustainable (Bowen-Jones and Pendry 1999), with most hunting reportedly driven by economic incentives rather than sustenance. Efforts to conserve wildlife in Togo face significant challenges due to the cultural and economic benefits of the wild meat trade. For example, some communities, like Bassar in the central region, are well known for their traditional hunting (e.g. Sonhaye-Ouyé et al. 2022). Additionally, as wild meat is a vital source of protein and income for many communities in rural areas, authorities have found it difficult to enforce hunting regulations (Fa et al. 2002; D'Cruze et al. 2020; Luiselli et al. 2020; Sonhaye-Ouyé et al. 2022).

Aside from the conservation implications, this trade also represents a major public health risk due to the potential for zoonotic disease transmission (Rosen and Smith 2010; Ordaz-Nemeth et al. 2017; González et al. 2020; Morcatty et al. 2021; Nijman et al. 2023). The lack of biosecurity typical of traditional African bushmeat markets has been cited as an increasingly concerning pathway for disease transmission in recent decades (Can et al. 2019). Bushmeat from African wildlife, particularly primates and rodents, has been highlighted as a source for zoonotic pathogens (Smith et al. 2012; Peros et al. 2021), and bushmeat-related activities have been linked to numerous emerging infectious disease outbreaks, such as Ebola, HIV, and SARS (Kurpiers et al. 2016). Beyond zoonotic risks, transportation, handling and consuming wild meat can also expose people to bacterial and parasitic infections, foodborne illness, and toxic substances (van Vliet et al. 2017; Ahouanse et al. 2023). Several species detected in this study are of heightened zoonotic disease risk including small carnivores like the African wildcat, mongooses, and jackals, as well as rodents like rats, porcupines, and squirrels (Han et al. 2015; Johnson et al. 2020; Mgba 2024).

Our findings also draw attention to the animal welfare concerns associated with this type of trade. The posts analyzed featured thousands of individual wild animals, all of which would have suffered to some degree during capture, transport, onward sale and slaughter (Baker et al. 2013). Severe animal welfare issues are associated with the hunting practices of some of the species featured, such as pangolins. For example, pangolin hunting can involve animals being forcibly extracted from their burrows or tree dens during capture, and suffering may be particularly apparent during slaughter as it has been reported that the animals are sometimes still alive when they are placed in boiling water or fire to aid scale removal (D'Cruze et al. 2018).

Legality

Wildlife exploitation in Togo is regulated by international conventions and the Law No. 2008-09 of the Carrying Forest Code. For example, Article 79 of the Carrying Forest Code states that individuals must possess a hunting title or permit to engage in hunting activities, except when exercising customary or traditional hunting rights. However, the legal status of commercial wildlife trade in Togo is complicated by the presence of several different and potentially conflicting pieces of domestic legislation (D'Cruze et al. 2020). For example, while pangolins are partially protected by national legislation in Togo, their capture is allowed under certain circumstances in accordance with the Wildlife Protection and Hunting Ordinance (1968) and the updated Decree (1980). Despite these uncertainties, the

videos analyzed, and the species shown, appear to violate national regulations. For example, Article 61 of the 005 Framework Law on the Environment (2008) stipulates that hunting should be managed in a sustainable manner. However, this is unlikely for some of the species featured in the posts, including pangolins, especially in the absence of effective monitoring and enforcement mechanisms.

From an international trade perspective, some of the wild animals sold online via TikTok are also currently afforded some level of legal protection via CITES, including the white-bellied pangolin (which is listed in CITES Appendix I), African wildcat, Nile monitor and Savanna monitor (all CITES Appendix II-listed). As such, the commercial trade of meat for international export and cross-border trade would be illegal if from CITES Appendix I-listed species, or from CITES Appendix II-listed species without an official export permit. However, the open advertisement of protected and threatened species on TikTok signals weak enforcement of both national and international legislation. In addition, there are reports of wild meat being clandestinely transported from rural areas to Lomé, often hidden within vehicles transporting goods such as charcoal, firewood, cereals and yam, sometimes even in minibuses carrying passengers (Assou, unpublished data). Similar observations have been reported in Burkina-Fazo (Hema et al. 2019). While the investigation into local wild meat consumption focuses on domestic trade in urban centers, the illegal accumulation and smuggling of easily preservable specimens, such as pangolins and their scales, remain a pressing concern (Nuwer 2020; Xi et al. 2025). Improper management and protection of animals locally could fuel illegal trade. Given the interconnected nature of local markets and consumer demand, it is possible that some of this trade illegally crosses borders, at least into Benin, Ghana and Nigeria (Koutchoro et al. 2024) because wild meat can easily move between countries within the sub-region due to the porosity of the borders (see Toudonou et al. 2022).

Moreover, the apparent ease of accessing wild meat online, along with reports of illegal wild meat products of West and Central African origin, most commonly rodents, being seized at European airports (Chaber et al. 2010, 2019; Wood et al. 2014), suggests that social media may also be facilitating trade outside of Africa. Indeed 'luxury' markets for African wild meat products are reportedly emerging in Europe (Chaber et al. 2010), possibly driven by financial incentives due to the higher prices that these products can fetch at markets in Europe (Moloney et al. 2023). The open sale of wildlife on TikTok also highlights inadequate enforcement of the platform's own Community Guidelines (https://www.tiktok.com/community-guidelines/en) which state that content that depicts or promotes the poaching or illegal trade of wildlife is not allowed on the platform and will be removed when identified. While not all wildlife trade is necessarily illegal, some of the species featured in the posts, such as pangolins, are protected under national and international legislation. Their sale is likely to be unlawful without the necessary documentation or permits, which are neither shown nor referenced in any of the content reviewed.

Study limitations

We recognize some limitations to this study. Firstly, we analyzed eighty (80) posts across only two TikTok channels, and therefore it is possible that we have not captured the complete diversity of species or volume of wild meat

products available for sale online. Rather, it is likely that our observations are just the tip of the iceberg. We provide important initial insight into this online trade; however, a full inventory of the wild animal species being sold online on TikTok was beyond the scope of this study. Regarding our estimates of the number of individual animals involved, although it is possible that the same individual animals are shown in more than one video, the fact that each individual video depicted a different setting with different species and numbers of individuals on display would suggest otherwise, though it was not possible to confirm this. Furthermore, the quality of videos posted and the status of the animals depicted (e.g. many were smoked) may have also limited our ability to accurately identify species, as we were unable to verify the species advertised through field surveys or DNA analysis. Although the authors have extensive experience assessing the wildlife and wild meat trade in Togo, developed over more than a decade of field work, we acknowledge that our analysis of the inferred species featured in the posts may not represent a complete or fully accurate taxonomic account. In addition, we highlight the accessibility of wild meat advertisements available online in Togo, but we cannot be certain that these products are actually being sold. Despite these limitations, we believe that our findings represent valuable information that can be used to help inform future efforts to protect wildlife in Togo.

Recommendations and future research

Our findings provide further evidence on the role of social media in facilitating wild meat trade in West Africa, highlighting how conservation efforts should be vigilant to the full spectrum of wildlife trade markets including the rise in sales of wildlife online. In order to better understand and regulate national and international wildlife trade, we recommend closer monitoring of online advertisements and sales of wildlife, along with further investigations into the role of social media in facilitating this trade. Greater research efforts are needed to assess the impacts of online wild meat trade on both individual and wild animal populations, particularly in relation to animal welfare. In addition, studies should also explore how online visibility influences consumer demand and societal perceptions of wild meat consumption. In particular, this should include studies on the distribution and conservation status of species, as well as assessment of the impact of their exploitation on long-term conservation efforts (see CITES Resolution Conf. 13.11). In this context, species already considered threatened or Near Threatened by extinction (white-bellied pangolin, Buffon's kob, and Defassa waterbuck), those listed as Data Deficient (e.g. Walter's duiker), and those with populations already thought to be in decline (10 inferred species) should be prioritized.

Effective management of wildlife trade and consumption also requires strategies to reduce demand, underpinned by understanding of the underlying drivers (Zhang et al. 2022). Additional research should therefore focus on the socio-economic and societal pressures responsible for this type of consumer demand, including studies focused on consumer attitudes and behavior, hunting and trade practices, and the different actors involved in the trade (Moorhouse et al. 2023, 2024). This type of information could aid future initiatives

aimed at minimizing any negative impacts on people and wildlife, including supporting alternative livelihood transitions for those who are economically dependent on the trade (Damania et al. 2005; Lindsey et al. 2013; Gonçalves et al. 2019). We also suggest that future studies incorporate more in-depth analysis of the sentiment of those interacting with these posts in order to inform the development of effective and targeted public awareness campaign strategies (Harrington et al. 2023).

As highlighted in this study, it is also important to note that women play a significant role in the urban wild meat trade, primarily as market vendors who supply wild meat to urban consumers (Green et al. 2024). Their participation in this sector is largely driven by economic necessity. However, despite their central role, women's contributions are often overlooked in policy discussions and enforcement strategies. Green et al. (2024) advocate for a gender-sensitive approach to wildlife conservation and trade regulation, highlighting the importance of addressing the socio-economic realities faced by women in the wild meat trade to ensure interventions are both effective and equitable.

Finally, the accessibility of wild meat advertisements on TikTok clearly demonstrates shortcomings and the need for increased clarity regarding the domestic legislation and associated penalties (e. g. D'Cruze et al. 2020), and the differentiation between implications for subsistence and commercial use of wildlife in Togo. With regards to social media platforms, many including TikTok, have policies in place that prohibit the online sale of wildlife and endangered species, and are part of initiatives aimed at tackling wildlife crime, such as the Coalition to End Wildlife Trafficking Online (Coalition to End Wildlife Trafficking Online 2021; TRAFFIC 2021). However, actions of these platforms mainly target prohibiting illegal wildlife trade (Di Minin et al. 2018; Jain et al. 2020), and appear to be ineffective at restricting and removing wildlife trade content, highlighting limitations in their approach. Given their extensive resources and technological expertise, TikTok and other social media platforms should move beyond merely moderating content. Specifically, we recommend they implement automated detection systems to identify and remove illegal wildlife trade content (including posts featuring wild animal carcasses or derivatives). Platforms should also collaborate with conservation organizations and other wildlife experts to help verify suspicious posts and launch in-app awareness campaigns to educate users about the impacts of wildlife trade while promoting ethical wildlife engagement (Wu et al. 2018; Bergman et al. 2022).

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Additional information

Conflict of interest

The authors have declared that no competing interests exist.

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Use of AI

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Author contributions

Assou D., Elwin A., Megson D., Ping X., Zeng Y., Zhu J., Segniagbeto G.H. and D'Cruze N. designed the study. Assou, D. conducted the data collection. Assou D. and Elwin A. processed and analyzed the data. The initial draft of the manuscript was written by Assou D. All contributing authors actively engaged in revising and reaching consensus on the final version for publication.

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Data availability

All of the data that support the findings of this study are available in the main text.

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